
LD 33: Peripheral Equipment Diagnostic for 1.5 Mb/s RPE and Fibre Remote IPE

This module contains commands to perform diagnostic tests of 1.5 Mb/s remote peripheral equipment and fibre remote intelligent peripheral equipment.

Note: Program 33 is not supported on Option 11 systems.

1.5 Mb/s RPE diagnostic

The 1.5 Mb/s Remote Peripheral Equipment Diagnostic (RPD) is loaded manually or as one of the daily routines. It should be included in the daily routines for any system having Remote Peripheral Equipment (RPE).

Program operation during daily routines

When loaded as part of the daily routines, the program will, for each RPE loop in the system:

- reset internal counts of carrier failures which are used to determine whether carriers should be automatically re-enabled if a temporary carrier fault occurs
- test the connection memory on the local network pack
- test the signaling channel to the Local Carrier Buffer (LCB) pack
- test the connection memory of the Remote Peripheral Switch (RPS) pack
- test the continuity of the speech path to the remote site using all idle channels
- switch the primary carrier function from the current primary carrier to the other one, then repeat the above tests

If faults are detected during the above tests, the primary carrier is selected to give the greatest number of working speech timeslots, provided that the signaling channel works on this carrier.

Purpose of 1.5 Mb/s RPE commands

When loaded manually, the program may be used to:

- conduct a test of a specific RPE loop, similar to the automatic tests
- enable or disable a RPE loop, or either carrier associated with a RPE loop
- enable or disable the automatic carrier status monitoring function on a RPE loop
- give timeslot numbers of speech channels which could not be successfully transmitted by a specified carrier
- switch the primary carrier function from one carrier to the other
- obtain the status of RPE loops and/or carriers
- obtain a list of equipped RPE loops
- clear minor alarms and the maintenance display on the active CPU

Speech timeslots used by each carrier

If primary carrier = 0

- Speech channels carried by primary carrier = 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31
- Speech channels carried by secondary carrier = 2, 3, 8, 9, 16-19, 24, 25

If primary carrier = 1

- Speech channels carried by primary carrier = 2, 3, 4, 5, 8, 9, 10, 11, 16, 17, 18, 19, 20, 21, 24, 25, 26, 27, 28, 29
- Speech channels carried by secondary carrier = 6, 7, 12, 13, 14, 15, 22, 23, 30, 31

Fibre Remote IPE diagnostic

The craftsperson may complete any of the following Fibre Remote IPE maintenance operations:

- 1 Enable or disable optical packets.
- 2 Manually invoke protection switching, at the local or remote side.
- 3 Query status of cards and optical packets.
- 4 Conduct the loop-back test on the optical receiver-transmitter (EOI) to determine the source of the fault as being the optical fibre span or Fibre remote equipment.
- 5 Run loopback test and continuity tests on optical interface.

Midnight routine operation

Overlay 33 can be scheduled to run at midnight if included in midnight routines. The following actions take place during midnight operation:

- 1 Send Time of Day message to loadware (L/W).
 - 2 Print performance monitoring report.
 - 3 Run non-service-impacting test on the standby link.
 - 4 Run MNSN and MNSP commands to cause protection switching. When these commands are run, continuity tests check both links alternately.
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Basic commands for 1.5 Mb/s RPE

CDSP	Clears the maintenance display on active CPU to 00 or blank
CMIN	Clear the minor lamp on a system basis
CMIN ALL	Resets minor alarm indication on attendant consoles for all customers
CMIN c	Resets minor alarm indication on attendant consoles for customer c (not applicable for Release 22)
DISC loop c	Disable carrier c on RPE loop
DISI loop c	Disable carrier c on RPE loop when idle
DISL loop	Disable specified RPE loop
DISM loop	Disable carrier status monitoring on RPE loop
END	Abort current command
ENLC loop c	Enable carrier c on RPE loop
ENLL loop	Enable RPE loop
ENLM loop	Enable carrier status monitoring on RPE loop
LDIS loop c	List all speech channels that failed continuity test on RPE loop carrier c
LOOP loop	Perform various tests on RPE loop
LRPE	List all equipped RPE loops
NCAR loop	Get number of "carrier status change" messages for RPE loop
SCAR loop	Switch primary carrier on RPE loop
STAT	Get number of busy channels on specified carrier in the active DISI request
STAT loop	Get status of RPE loop
STAT loop ALL	Get status of the RPE loop, carriers and RPS card
STAT loop c	Give status of carrier c on RPE loop
STAT loop RPS x	Get status of RPS card x on specified RPE loop

Basic commands for Fibre Remote IPE

AHIN sl	Print all history file (log file) of Fibre superloop sl
AHIP pc	Print all history file of Fibre Peripheral Controller pc
CDSP	Clears the maintenance display on active CPU to 00 or blank
CMIN	Clear the minor lamp on a system basis
CMIN ALL	Resets minor alarm indication on attendant consoles for all customers
CLPM sl	Clears all performance monitoring counters of Fibre superloop sl (FNET) and its associated FPEC
DSOP sl PRI	Disable optical link of Fibre superloop sl, link Primary
DSOP sl SEC	Disable optical link of Fibre superloop sl, link Secondary
ENOP sl PRI	Enable optical link of Fibre superloop sl, link Primary
ENOP sl SEC	Enable optical link of Fibre superloop sl, link Secondary
FDEF sl	Query default MMI mode on FNET and FPEC of Fibre superloop sl
FNET ALL	Print current status of all Fibre superloops
FNET sl	Print status of Fibre superloop sl (FNET) and its optical packets
FNTT sl	Test specified Fibre superloop sl (FNET)
FPCT pc	Test specified Fibre peripheral controller pc (FPEC)
FPEC pc	Print status of Fibre peripheral controller pc (FPEC) and its optical packets
FSTA sl	Print the transmission test status of Fibre superloop sl
FSTP sl	Stop the transmission test. Print test status of Fibre superloop sl.
FTST sl test (h/m/s)	Perform a transmission test of Fibre superloop sl for time h/m/s
MNSN sl	Manual switch on Fibre superloop sl (FNET)
MNSP sl	Manual switch on Fibre peripheral controller pc (FPEC)
NHIN sl	Print new history file of Fibre superloop sl (FNET)
NHIP pc	Print new history file of Fibre peripheral controller pc (FPEC)
PRPM sl	Print performance monitoring report for Fibre superloop sl (FNET) and its associated FPEC
SDEF sl LOC	Set default MMI mode on FNET and FPEC of Fibre superloop sl: MMI mode (Local)
SDEF sl REM	Set default MMI mode on FNET and FPEC of Fibre superloop sl: SL-1 mode (Remote)

Alphabetical list of commands

Command	Description	Pack/Rel
AHIN sl	Print all history file (log file) of Fibre superloop sl.	rem_ipe-22
AHIP pc	Print all history file of Fibre Peripheral Controller pc.	rem_ipe-22
CDSP	Clears the maintenance display on active CPU to 00 or blank.	rpe-1
CLPM sl	Clears all performance monitoring counters of Fibre superloop sl (FNET) and its associated FPEC.	rem_ipe-22
CMIN	Clear the minor lamp on a system basis.	alarm_filter-22
CMIN ALL	Resets minor alarm indication on attendant consoles for all customers.	rpe-1
CMIN c	Reset minor alarm indication on attendant consoles for customer c (not applicable for Release 22).	rpe-1
DISC loop c	Disable carrier c on RPE loop. Any active calls using this carrier will be disconnected.	rpe-1
DISI loop c	Disable carrier c on RPE loop when idle. Disables the carrier as soon as it has become idle. The number of channels still busy on the carrier may be checked using the STAT command. The message RPD018 indicates that the disable operation is complete.	rpe-1
DISL loop	Disable specified RPE loop. Any active calls on the loop are disconnected and line transfer occurs at the remote end.	rpe-1
DISM loop	Disable carrier status monitoring on RPE loop. Carrier failures are not detected while this command is in effect. The command is canceled by the ENLM or ENLL commands.	rpe-1
DSOP sl PRI	Disable optical link of Fibre superloop sl, link Primary. If that link is active, protection switching occurs. If protection switching is not available, and the FNET is enabled, the command is refused.	rem_ipe-22

DSOP sl SEC	Disable optical link of Fibre superloop sl, link Secondary. If that link is active, protection switching occurs. If protection switching is not available, and the FNET is enabled, the command is refused.	rem_ipe-22
END	Abort current command. If no command is in progress, the active DISI command (if any) is canceled.	rpe-1
ENLC loop c	Enable carrier c on RPE loop. If the operation is successful, OK is output.	rpe-1
ENLL loop	Enable RPE loop. Implies ENLM also. If the operation is successful, OK is output. If the loop is already enabled, RPD007 is output.	rpe-1
ENLM loop	Enable carrier status monitoring on RPE loop.	rpe-1
ENOP sl PRI	Enable optical link of Fibre superloop sl, link Primary. The command fails if the packet is not physically there.	rem_ipe-22
ENOP sl SEC	Enable optical link of Fibre superloop sl, link Secondary. The command fails if the packet is not physically there.	rem_ipe-22
FDEF sl	Query default MMI mode on FNET and FPEC of Fibre superloop sl. The system response is: FNET: L/R FPEC: L/R Where: L = local and R = remote	rem_ipe-22
FNET ALL	Print current status of all Fibre superloops. The same as FNET sl but repeated for all Fibre superloops in the system.	rem_ipe-22

FNET sl Print status of Fibre superloop sl (FNET) and its optical packets. The first line prints the general status of the card and includes: rem_ipe-22

1. enable/disable status (known by Software)
2. PLL status
3. NNDC (indicates that new data calls are disallowed on this superloop)

The next two lines print the status of the packets:

1. enable/disable status (known by Firmware)
2. activity (if selected as active for incoming voice/data)
3. ALM_LVL - alarm level
4. ALM_EOI - alarm Electro-Optical Interface (EOI)

Presented below is an example of this general Output format, showing possible values. Bold characters indicate fixed titles.

FNET: n	enabled/disabled	locked/unlocked	NNDC/ <blank>	
PACKLETS:	F/W State	Activity	ALM_LVL	ALM_EOI
Primary:	enabled	RCV	unequipped	Rx
	disabled	idle	S.F.	Tx
	transmission tested		S.D.	Rx Tx
			No alarm	No alarm
Secondary:	enabled	RCV	unequipped	Rx
	disabled	idle	S.F.	Tx
	transmission tested		S.D.	Rx Tx
			No alarm	No alarm

Where:

1. unequipped = the optical packet is physically absent. Firmware treats this as Signal Fail.
2. S.F. = Signal Fail = Out of service. Loadware either switches to the other link or declares "No active link" if Protection Switching (PS) was not possible.
3. S.D. = Signal Degradation = Deteriorated performance. Firmware either switches to the other link, or else the data calls are disallowed if Protection Switching (PS) was not possible. Software handles this state as NNDC.
4. Rx = Receiver alarm
5. Tx = Transmitter alarm

FNTT sl	Test specified Fibre superloop sl (FNET). The Firmware performs a self-test of hardware components and reports results to software. Optical packlets, if present, are also tested. If the FNET is enabled, only the non-active packlet is tested without affecting service. The response may be: TEST PASSED or TEST FAILED REASON <reason#>	rem_ipe-22
FPCT pc	Test specified Fibre peripheral controller pc (FPEC). The Firmware performs a self-test of hardware components and reports results to software. Optical packlets, if present, are also tested. If the FPEC is enabled, only the non-active packlet is tested without affecting service. The response may be: TEST PASSED or TEST FAILED REASON <reason#>	rem_ipe-22
FPEC pc	Print status of Fibre peripheral controller pc (FPEC) and its optical packlets. The first line prints the general status of the card. The next two lines print the status of the packlets. See FNET description for more detail.	rem_ipe-22
FSTA sl	Print the transmission test status of Fibre superloop sl.	rem_ipe-22
FSTP sl	Stop the transmission test. Print test status of Fibre superloop sl.	rem_ipe-22

FTST sl test (h/m/s)	Perform specified transmission test of Fibre superloop sl for time tm. Where: 1. test = 1 for FNET primary packet ; 2 for FPEC primary packet ; 3 for FNET secondary packet ; 4 for FPEC secondary packet 2. tm = H/M/S = test duration. This field is optional. The duration can be either: - a H for hours (1-24) - b M for minutes (1-255) - c S for seconds (1-255) If a duration is not entered, then Firmware performs a quick test and reports the results to software. The system response will then be <code>TEST SUCCESS</code> or <code>TEST FAILED</code>. If duration is entered, then firmware starts testing and sends an acknowledge message to software. The system response will be <code>TEST STARTED</code>. These transmission tests can only be executed on the standby or disabled link.	rem_ipe-22
LDIS loop c	List all speech channels that failed continuity test on RPE loop, carrier c. If no channels failed, response is <code>NONE</code>. The response is based on the results of the most recent tests (via the <code>LOOP</code> command) of the carrier.	rpe-1

LOOP loop	Perform various tests on RPE loop. Performs the following tests: 1. tests idle timeslots of network connection memory 2. tests signaling channel to the LCB pack 3. tests idle timeslots of the RPS connection memory 4. tests speech continuity to remote site, using idle channels If all tests pass, system response is OK. Any connection memory or channel faults detected results in the affected channel being disabled. To completely check the loop, this command may be run twice, once with each carrier being primary, by using the SCAR command between tests. This command does not test signaling to PE packs on the loop. To test signaling, use LD 30 or LD 45.	rpe-1
LRPE	List all equipped RPE loops. If no RPE loops exist, the response is NONE.	rpe-1
MNSN sl	Manual switch on Fibre superloop sl (FNET). The FNET loadware switches between the active link and the standby link.	rem_ipe-22
MNSP pc	Manual switch on Fibre peripheral controller pc (FPEC). The FPEC loadware switches between the active link and the standby link.	rem_ipe-22
NCAR loop	Get number of "carrier status change" messages for RPE loop. This outputs the number of messages received from the RPE loop since the most recent running of the midnight routines, initialize or loop enable. Response is: • LCB: XX • CAR 0: YY, CAR 1: ZZ The Local Carrier Buffer (LCB) pack gives the total number of messages received. CAR 0 and CAR 1 indicate the number of those messages which indicated a change of state of the corresponding carrier. The count for each carrier is reset when the carrier is manually enabled or at midnight.	rpe-1

A large number of messages received (particularly on one carrier only), may indicate a transient fault on the affected carrier.

NHIN sl	Print new history file of Fibre superloop sl (FNET)	rem_ipe-22
NHIP pc	Print new history file of Fibre peripheral controller pc (FPEC)	rem_ipe-22
PRPM sl	Print performance monitoring report for Fibre superloop sl (FNET) and its associated FPEC.	rem_ipe-22
SCAR loop	Switch primary carrier on RPE loop. This command is allowed only if the current non-primary carrier is enabled, and no faults exist on the current non-primary carrier (which would reduce the number of working speech channels if it becomes the primary carrier).	rpe-1
SDEF sl LOC	Set default MMI mode on FNET and FPEC of Fibre superloop sl : MMI mode (Local)	rem_ipe-22
SDEF sl REM	Set default MMI mode on FNET and FPEC of Fibre superloop sl : SL-1 mode (Remote)	rem_ipe-22
STAT	Get number of busy channels on specified carrier in the active DISI request. If no DISI request is active, error code RPD022 is output.	rpe-1
STAT loop	Get status of RPE loop. Response will be one or more of the following: 1. x BUSY, x DSBL = number of busy/disabled speech channels on the loop. 2. x NWK MEM FLTS = number of speech channels disabled due to fault in connection memory of network. 3. LCB DSBL = carrier monitoring function of LCB pack disabled 4. CTYF: 11 12 = cannot receive speech from loops l1, l2, etc., based on most recent test run by the background diagnostic (LD 45).	rpe-1

5. **DSBL: RESPONDING** = loop is disabled but can still communicate with the CPU. The loop may have been disabled manually, as the result of the disabling of some other pack (e.g., associated Peripheral Signaling pack) or by an overload condition. If the loop was disabled because of overload, the overload condition may recur if the loop is re-enabled.
6. **DSBL: NOT RESPONDING** = loop is disabled and cannot communicate with the CPU. The Network pack may be missing or faulty, or not responding because of the removal or failure of other packs, e.g., CE extenders.

STAT loop ALL Get status of the RPE loop, carriers and RPS card. rpe-1

Response is:

```
x BUSY, y DSBL
CAR 0: x BUSY, y DSBL PRIME
CAR 1: x BUSY, y DSBL
RPS: x MEM FLTS
```

Where:

x BUSY, y DSBL = number of busy and disabled channels for the RPE loop and each carrier (CAR0 and CAR1).

PRIME = indicates which carrier is currently the primary one.

RPS: x MEM FLTS = number of faults in the memory connection of the RPS card.

STAT loop c Give status of carrier c on RPE loop. rpe-1

Response is one or more of:

1. x BUSY, y DSBL = number of busy channels and number of channels having continuity failure on this carrier
2. PRIME = indicated carrier is currently the primary one.
3. DSBL = carrier is disabled.
4. LOOP DSBL = loop is disabled.

STAT loop RPS x rpe-1
Get status of RPS card x on specified RPE loop.

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Results are based on the most recent tests. Response is one of:

1. `x MEM FLTS` = number of faults in the connection memory of the RPS card
 2. `NOT RESPONDING` = card failed to respond (this message does not necessarily indicate a RPS fault)
 3. `LOOP DSBL` = loop is disabled.
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